

2007 MONITORING NETWORK PLAN

Introduction

Since 1979 the air monitoring program has been producing an annual NETWORK REVIEW. The purpose of this report was to document that the agency was actively evaluating monitoring requirements and using resources effectively. Federal regulatory changes in December of 2006 altered this old grant requirement to require an annual monitoring network plan supplemented every five years by an assessment of the air quality surveillance system. This is the Montana Department of Environmental Quality's (MTDEQ) first monitoring network plan.

The objective of this report is to accurately describe the monitoring sites in the agency network, and identify their monitoring objectives. It should also describe any deviations in physical characteristics or operation from regulatory requirements. The report will also describe changes we anticipate making to the network in the coming year. A summary of existing network sites is provided in Table 3 of this document. Table 4 identifies site locations. Site descriptions are ordered from lowest to highest AQS number which is also alphabetically by county.

The number of air quality monitors required by regulation in an area is a function of population density and air quality. No population area in Montana has enough people to require more than one monitor for any pollutant where air quality is bad and to require any monitoring where air quality is good. MTDEQ has monitors in place where there are known air quality issues and continues to investigate suspect areas.

MTDEQ's air monitoring sites meet all of the EPA's siting requirements with the few exceptions described below, and they are all operated to conform with EPA requirements for quality control and quality assurance for SLAMS sites.

Monitoring Sites

30-013-0001 Great Falls-Overlook Park

This site was established in 2001 to monitor carbon monoxide continuously. It is microscale representative, and its monitoring objective is to track compliance with the NAAQS for the "Limited Maintenance Plan" in the 10th Avenue CO nonattainment corridor.

30-013-1026 Great Falls-High School

This site has been monitoring PM_{2.5} since January 2000. The neighborhood scale site is near the center of the city, and was established to monitor population exposure to area PM_{2.5} emissions. The monitor is in the corner of a large football field and about 5 meters from each of two roadways. While this is undesirably close to the roads, one dead-ends at the end of the block, and the other has very little traffic.

30-029-0007 Columbia Falls-Ball Park

This collocated PM₁₀ site began operating in 2006 and exists to demonstrate continued compliance with the NAAQS in the Columbia Falls PM₁₀ nonattainment area. The site is neighborhood scale and located in the corner of a park between an industrial park to the North and a residential neighborhood to the South. A tree partially obstructs about 90 degrees to the East, and the monitors are closer than desirable to the adjacent roadways which are paved and have very low traffic volumes.

30-029-0009 Whitefish-Dead End

This particulate site monitors both PM₁₀ and PM_{2.5}. It is located at the end of 10th Street near the point where US 93 crosses the Whitefish River. The site is representative at the neighborhood scale and was installed to provide continuing monitoring for the PM₁₀ nonattainment area designated in 1993, and to assess population exposure to fine particulate. It also provides continuous particulate data for the local burning control program.

30-029-0010 Kalispell-Moose's Saloon

This microscale carbon monoxide site is on the south side of Idaho Ave. near the intersection of Idaho & Main in downtown Kalispell. Exceedances of the CO NAAQS were measured across the street from this site in 1996, and subsequent studies have shown this to be the highest carbon monoxide area in Kalispell. The site was established in 2003 to monitor continuing compliance with the NAAQS.

30-029-0047 Kalispell-Flathead Electric

This particulate site was installed in 1999 to consolidate particulate monitoring in Kalispell. The site is neighborhood scale and provides population exposure information for both PM₁₀ and PM_{2.5}. It also provides continuous particulate data for the county's burning control program, and demonstrates continuing compliance with the NAAQS in the Kalispell PM₁₀ nonattainment area designated in 1990.

30-031-0006 Bozeman-Wastewater Treatment Plant

This PM_{2.5} site is located at the north-west corner of Bozeman adjacent to the wastewater treatment plant. It is neighborhood scale, and it was positioned to measure down-slope flow from Bozeman toward Belgrade. While the site does represent some population, its principle function is to provide information on fine particulate dynamics in the Gallatin Valley.

30-031-0008 Belgrade-ConAgra

This PM_{2.5} site is located close to the center of the community. It is neighborhood scale and provides exposure information for the population. This site consistently measures the highest values in the Gallatin Valley. Land use changes may force us from this site in the near future.

30-031-0013 West Yellowstone-Park Entrance

This site monitors carbon monoxide and PM_{2.5}. It was established in 1998 to measure CO at the park entrance, and is microscale in its representation. PM_{2.5} monitoring was added in 2003, and is measured both continuously and at six day intervals. The site is very close to the entrance roadway and it is surrounded by tall trees. Air flow at monitoring height is up and down the roadway. Results are relevant to only the immediate local.

30-031-0016 West Yellowstone-City Center

This site was established in 2007 to monitor community wide exposure to carbon monoxide and fine particulate. It is in the center of town and neighborhood scale.

30-049-0018 Helena-Lincoln School

This neighborhood scale site has been monitoring population exposure to particulate since 1989. It is currently measuring PM_{2.5} both continuously and at three day intervals.

30-049-0026 Helena-Rossiter Pump House

This neighborhood scale site is in the middle of an elementary school play field at the bottom of the Helena Valley. It exists to monitor population exposure to fine particulate and to track the impact of continuing development in the valley. The site has a long history of measuring PM₁₀, but it was switched to measuring PM_{2.5} in January of 2007.

30-053-0018 Libby-Courthouse Annex

This neighborhood scale site is on the roof of the Courthouse Annex in the center of Libby, MT. It has been in operation since 1987. It is currently measuring particulate for population exposure and compliance with the NAAQS in the PM₁₀ and PM_{2.5} nonattainment areas.

30-063-0005 Missoula-Malfunction Junction

This microscale site exists to track continuing compliance with the carbon monoxide NAAQS in the Missoula CO nonattainment area. It operates only during the winter quarters when Missoula is subject to inversions.

30-063-0021 Seeley Lake

There is no monitoring history in Seeley Lake. This neighborhood scale site was installed along the main corridor (US 83) through town to monitor population exposure to PM₁₀ and PM_{2.5}.

30-063-0024 Missoula-Boyd Park

This neighborhood scale site has collected particulate data since 1981. It currently monitors PM₁₀ continuously to demonstrate continuing compliance with the NAAQS in the Missoula PM₁₀ nonattainment area.

30-063-0031 Missoula-Health Department

This neighborhood scale site is located on the roof of the city-county health department. It has monitored particulate since 1985. The site is currently a Speciation Trends PM_{2.5} site. It also samples PM_{2.5} and PM₁₀. The site's objective is to monitor population exposure to particulate and compliance with the NAAQS.

30-081-0007 Hamilton-PS#46

This neighborhood scale site is located in parking spot number 46 in the sheriff's lot at the corner of Madison and 3rd Street South. It has both continuous and FRM PM_{2.5} monitors. The site was established in 2005 less than a block away from our former site on the Courthouse roof to monitor population exposure and compliance with the NAAQS. The move was made to accommodate continuous monitoring required for near-real-time reporting of smoke during the summer wildfire season. The site is on a paved lot within 5 meters of a gravel alley and Madison St. which is paved. The alley sees virtually no use, and Madison street is low volume.

30-089-0007 Thompson Falls-High School

This site is located on the East side of Thompson Falls at the High School. It is neighborhood scale in its representation and it was established in 1999 to monitor population exposure to PM₁₀ and PM_{2.5} and compliance with the NAAQS. Thompson Falls was designated nonattainment for PM₁₀ in December of 1993.

30-093-0005 Butte-Greeley School

This neighborhood scale site is located at an elementary school in a residential neighborhood on the north side of Butte near the current mining activity. The site monitors population exposure to particulate. Continuous PM₁₀ monitoring provides response capability for the burning control program and monitors compliance with the NAAQS. PM_{2.5} compliance is measured with an FRM sampler. Butte was designated nonattainment for PM₁₀ in 1990.

30-111-0066 Billings-Coburn Rd.

This neighborhood scale site is located on high ground south of the Conoco and Exxon refineries. It is a major receptor for SO₂ and exists to monitor compliance with the federal and state SO₂ standards.

30-111-0085 Billings-St. Luke's

This micro scale carbon monoxide site is in downtown Billings at the corner of 2nd Ave. North and North 32nd Street. This site was installed to demonstrate Billings' continuing compliance with the CO NAAQS.

30-111-0086 Shepherd-Bus Barn

This neighborhood scale site was located to receive maximum ozone impact from Billings. It is about ten miles north-east of Billings in the Yellowstone River valley. It has been monitoring nitrogen oxides and ozone since June of 2005.

30-111-1065 Billings-Lockwood Park

This neighborhood scale site is located at Lockwood Park on Old Hardin Road at the east end of Billings. It has monitored population exposure to PM₁₀ since 1996 and PM_{2.5} since 1999.

Proposed Changes

We propose to eliminate PM₁₀ monitoring in Billings. The Lockwood Park site has a long history of measuring consistently low values as indicated in the following table. We know of no other locations in the Billings area that should be

Billings PM-10

Year	1st High	2nd High	3rd High	4th High	Annual Ave.
1996	89	75	67	63	27.9
1997	111	95	72	65	23.8
1998	102	92	91	89	26.4
1999	118	69	69	67	21.3
2000	49	43	41	40	18
2001	32	32	31	30	16
2002	27	26	24	23	13.6
2003	45	34	32	30	15.8
2004	39	38	35	28	16.4
2005	52	32	32	32	15.1
2006	39	33	27	26	15.9

Table 1

monitored for PM₁₀, and additional data from Lockwood Park would not be useful.

We also propose to discontinue the ozone and nitrogen oxides monitoring at Shepherd-Bus Barn. At this point we have observed two ozone seasons and

two winters. The highest hourly average ozone value during this period was 0.071 ppm. The fourth highest 8 hour running averages for the 2005 and 2006 ozone seasons were 0.058 and 0.061 ppm. These values are well short of the NAAQS. It would appear that Billings is too well ventilated to develop significant ozone levels. We propose to stop ozone monitoring at the end of the 2007 ozone season, and to stop nitrogen oxides monitoring at the end of the 2007 calendar year.

We have never monitored PM_{2.5} values in Columbia Falls. The community has a history of elevated particulate levels, most of which has been dust, but there is also significant wood burning in the area as well as a particle board plant and an aluminum smelter. Experience with PM_{2.5} monitoring in Whitefish and Kalispell shows that there is considerable variability across the Flathead Valley (see Table 2 below). There is no reason to believe that our knowledge of Whitefish or Kalispell is indicative of fine particulate levels in Columbia Falls. We propose to add PM_{2.5} sampling to our Columbia Falls-Ball Park site at the beginning of the 2008 calendar year. The sampling frequency would be every third day.

PM-2.5

Flathead Valley

Date	Whitefish	Kalispell
2/3/2005	9.7	14.5
2/6/2005	11.0	6.3
2/9/2005	13.3	13.4
2/12/2005	20.8	11.1
2/15/2005	12.3	7.1
2/18/2005	12.7	10.2
2/21/2005	20.2	13.8
2/24/2005	19.7	10.9
2/27/2005	14.0	9.1

Table 2

We have been seeking a maximum concentration PM_{2.5} site in the Belgrade area, and had intended to do some comparison studies during the 2007-2008 winter. Unfortunately, the property owner at the ConAgra site has told us that he intends to build on our current location in the near future. It may be necessary to relocate before comparisons can be made.

The above changes may occur. They reflect our current intentions. No changes will actually occur without additional discussions with EPA Region 8 and approval of a formal Network Modification Request.

Table 3
Existing Montana Ambient Air Monitoring Network

AQS Number	Site City-Name	Parameter	Method	Frequency	Type	Spatial Scale	Monitoring Objective*
<u>*H=high concentration, P=population exposure, S=source impact, B=background</u>							
30-013-0001	Great Falls-Overlook Park	42101-CO	093 ¹	Continuous	SLAMS	Micro.	H,P,S
30-013-1026	Great Falls-High School	88101-PM _{2.5}	142 ²	1 in 3	SLAMS	Neigh.	H,P
30-029-0007	Columbia Falls-Ball Park	81102-PM ₁₀ 85101-PM ₁₀	125 ³	1 in 6 (collocated)	SLAMS	Neigh	H,P,S
30-029-0009	Whitefish-Dead End	88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
		81102-PM ₁₀	122 ⁴	Continuous	SLAMS	Neigh.	H,P
		85101-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
30-029-0010	Kalispell-Moose's	42101-CO	093	Continuous	SLAMS	Micro.	H,P,S
30-029-0047	Kalispell-Flathead Electric	88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
		81102-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
		85101-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
30-031-0006	Bozeman-Waste Water Treatment Plant	88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
30-031-0008	Belgrade-ConAgra	88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
30-031-0013	West Yellowstone-Park Entrance	42101-CO	093	Continuous	SPM	Micro	S
		88101-PM _{2.5}	142	1 in 6	SPM	Micro	S
		88502-PM _{2.5}	731 ⁵	Continuous	SPM	Micro	S

Table 3 (Continued)
Existing Montana Ambient Air Monitoring Network

AQS Number	Site City-Name	Parameter	Method	Frequency	Type	Spatial Scale	Monitoring Objective*
<u>*H=high concentration, P=population exposure, S=source impact, B=background</u>							
30-031-0016	West Yellowstone-City Center	42101-CO	093	Continuous	SLAMS	Micro	H,P
		88101-PM _{2.5}	142	1 in 6	SLAMS	Neigh.	H,P
		88502-PM _{2.5}	731	Continuous	SPM	Neigh.	H,P
30-049-0018	Helena-Lincoln School	88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
		88502-PM _{2.5}	731	Continuous	SPM	Neigh.	H,P
30-049-0026	Helena-Rossiter Pump House	88101-PM _{2.5}	142	1 in 6	SLAMS	Neigh.	P
30-053-0018	Libby-Courthouse Annex	81102-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		85101-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		81102-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
		85101-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
		PM _{2.5} Speciation	810 ⁶	1 in 6	Supplmtl Speciation	Neigh.	H,P
		88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
		88101-PM _{2.5}	731	Continuous	SPM	Neigh.	H,P
30-063-0005	Missoula-Malfunction Junction	42101-CO	093	Continuous	SLAMS	Micro	H,P,S
				1 st &4 th quarters			
30-063-0021	Seeley Lake	81102-PM ₁₀	125	1 in 3	SLAMS	Middle	H,P,S
		85101-PM ₁₀	125	1 in 3	SLAMS	Middle	H,P,S
		88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P

Table 3 (Continued)
Existing Montana Ambient Air Monitoring Network

AQS Number	Site City-Name	Parameter	Method	Frequency	Type	Spatial Scale	Monitoring Objective*
<u>*H=high concentration, P=population exposure, S=source impact, B=background</u>							
30-063-0024	Missoula-Boyd Park	81102-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
		85101-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P
30-063-0031	Missoula-Health Dept.	81102-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		85101-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
		PM _{2.5} Speciation	810	1 in 3 Collocated	Trends Speciation	Neigh.	H,P
30-081-0007	Hamilton-Parking Spot #46	88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
		88502-PM _{2.5}	731	Continuous	SPM	Neigh.	H,P
30-089-0007	Thompson Falls-High School	81102-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		85101-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
30-093-0005	Butte-Greeley School	81102-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P,S
		85101-PM ₁₀	122	Continuous	SLAMS	Neigh.	H,P,S
		88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P
30-111-0066	Billings-Coburn Road	42401-SO ₂	100 ⁷	Continuous	SLAMS	Neigh.	H,S

Table 3 (Continued)
Existing Montana Ambient Air Monitoring Network

AQS Number	Site City-Name	Parameter	Method	Frequency	Type	Spatial Scale	Monitoring Objective*
<u>*H=high concentration, P=population exposure, S=source impact, B=background</u>							
30-111-0085	Billings-St. Luke's	42101-CO	093	Continuous	SLAMS	Micro.	H,P,S
30-111-0086	Shepherd-Bus Barn	44201-Ozone	019 ⁸	Continuous	SLAMS	Neigh.	H,P,S
		42601-NO	099 ⁹	Continuous	SLAMS	Neigh.	H,P,S
		42602-NO2	099	Continuous	SLAMS	Neigh.	H,P,S
		42603-NOx	099	Continuous	SLAMS	Neigh.	H,P,S
30-111-1065	Billings-Lockwood Park	81102-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		85101-PM ₁₀	125	1 in 6	SLAMS	Neigh.	H,P
		88101-PM _{2.5}	142	1 in 3	SLAMS	Neigh.	H,P

¹Teledyne-API Model 300. Nondispersive infrared-equivalent method.

²BGI-PQ200 with very sharp cut cyclone. Federal Reference Method.

³BGI-PQ200 with WINS eliminator. Federal Reference Method.

⁴MetOne BAM 1020. Beta attenuation monitor-equivalent method.

⁵MetOne BAM 1020 with PM_{2.5} sharp cut cyclone. Beta attenuation monitor.

⁶MetOne Speciation Air Sampling System.

⁷Teledyne-API Model 100. Ultraviolet fluorescence-equivalent method.

⁸Dasabi 1003AH. Ultraviolet absorption-equivalent method.

⁹Teledyne API Model 200e. Gas phase chemiluminescence-equivalent method.

Table 4
Montana Monitoring Site Locations

AQS Number	Site Name	Address	MSA/Urbanized Area	Latitude	Longitude
30-013-0001	Overlook Park	10 th Ave.S. and 2 nd St. E. Great Falls	Cascade County/Great Falls	47.49417	-111.30278
30-013-1026	High School	3 rd Ave. S. and 17 th St. E. Great Falls	Cascade County/Great Falls	47.20222	-111.27889
30-029-0007	Ball Park	C St. and 4 th Ave. E N Columbia Falls	Flathead County/Columbia Falls	48.38111	-114.17472
30-029-0009	Dead End	End of 10 th St. Whitefish	Flathead County/Whitefish	48.39972	-114.33361
30-029-0010	Moose's Saloon	Idaho Ave. Kalispell	Flathead County/Kalispell	48.20229	-114.31349
30-029-0047	Flathead Electric	Center St. and Woodland Ave. Kalispell	Flathead County/Kalispell	48.2025	-114.30556
30-031-0006	Wastewater Treatment Plant	2545 Springhill Rd. Bozeman	Gallatin County/Bozeman	45.72631	-111.0673
30-013-0008	ConAgra	100 S. Broadway Belgrade	Gallatin County/Belgrade	45.77277	-111.1775
30-013-0013	Park Entrance	West Entrance to Yellowstone National Park	Gallatin County/ West Yellowstone	44.65777	-111.09083
30-013-0016	City Center	West Yellowstone	Gallatin County/West Yellowstone	44.6617	-111.1049

Table 4 (Continued)
Montana Monitoring Site Locations

AQS Number	Site Name	Address	MSA/Urbanized Area	Latitude	Longitude
30-049-0018	Lincoln School	1325 Poplar St. Helena	Lewis & Clark County/Helena	46.60388	-112.03527
30-049-0026	Rossiter Pump House	1497 Sierra Rd. East Helena	Lewis & Clark County/Helena	46.6588	-112.0123
30-053-0018	Courthouse Annex	418 Mineral Ave. Libby	Lincoln County/Libby	48.38416	-115.54805
30-063-0005	Malfunction Junction	Fairgrounds Missoula	Missoula County/Missoula	46.84889	-114.01611
30-063-0021	Seeley Lake	Seeley Lake	Missoula County/Seeley Lake	47.1771	-113.4827
30-063-0024	Boyd Park	3100 Washburn Rd. Missoula	Missoula County/Missoula	46.84222	-114.01972
30-081-0007	Parking Spot #46	Madison and 3 rd St. S. Hamilton	Ravalli County/Hamilton	46.24563	-114.15886
30-089-0007	High School	Golf and Haley Thompson Falls	Sanders County/Thompson Falls	47.59639	-115.32361
30-093-0005	Greeley School	Butte	Silverbow County/Butte	46.0027	-112.5004
30-111-0066	Coburn Road	Coburn Hill Rd. Billings	Yellowstone County/Billings	45.78667	-108.45778
30-111-0085	Saint Luke's	2 nd Ave. N. and N. 32 nd St. Billings	Yellowstone County/Billings	45.78218	-108.51153

Table 4 (Continued)
Montana Monitoring Site Locations

AQS Number	Site Name	Address	MSA/Urbanized Area	Latitude	Longitude
30-111-0086	Bus Barn	Shepherd	Yellowstone County/Shepherd	45.94263	-108.35096
30-111-1065	Lockwood Park	Old Hardin Road Lockwood	Yellowstone County/Billings	45.80194	-108.42611